WHAT IS CLAIMED IS:

1. A method for generating a solution to a problem having objects scheduled originally in itineraries, each original itinerary having at least an origin and a destination, the method comprising the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying the objects to be rescheduled;

receiving a request for rescheduling of the objects from a user;

grouping the objects to be rescheduled into subproblems, wherein each subproblem is defined by each object therein having the same original origin and destination;

applying a first algorithm to each subproblem without allowing varying the origin and destination of the objects in the subproblem for simplification and, in turn, quickly reaching initial solutions;

identifying a subclass of objects that are unsuitably rescheduled in the initial solutions; and

applying a second algorithm for rescheduling the subclass that allows varying the original itinerary to generate rescheduling solutions for the subclass.

2. A method as recited in Claim 1, further comprising the step of applying a third algorithm to an IP problem based upon all of the objects.

3. A method as recited in Claim 2, wherein the third algorithm is an IP algorithm with a branch and bound technique .

4. A method as recited in Claim 2, further comprising the steps of excluding the subclass of objects from the objects that need to be rescheduled in the disruption specification and applying a fourth algorithm to the remaining objects in the reduced disruption specification to determine rescheduling solutions for the remaining objects.

5. A method according to Claim 4, wherein the first and fourth algorithms are transportation simplex algorithms.

6. A method as recited in Claim 1, wherein the subclass of objects to be rerouted are identified based upon a suitably of rescheduling criteria.

7. A method as recited in Claim 6, wherein identifying the subclass includes determining a cost for each rescheduled object and comparing the cost to a threshold.

8. A method as recited in Claim 1, wherein the objects are passengers traveling one or more legs between the origin and the destination.

9. A method as recited in Claim 1, wherein the rescheduling solutions include upgrading, downgrading, delaying, and offloading the objects.

10. A method according to Claim 1, wherein the second algorithm is selected from the group consisting of the Dijkstra algorithm and a K-shortest path algorithm.

11. A method for generating solutions to problems having objects scheduled in itineraries, the method comprising the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying at least one object to be rerouted;

applying a shortest path algorithm to generate a plurality of possible solutions for rerouting the at least one object;

forming an IP problem based upon the plurality of possible solutions; and

applying an IP algorithm to the IP problem for generating a practical solution for rerouting the at least one object.

12. A method as recited in Claim 11, wherein the event is selected from the group consisting of an airplane breakdown, a hub closing, flight cancellation and a weather storm.

13. A method as recited in Claim 11, wherein the IP algorithm utilizes a branch and bound technique.

14. A method for generating solutions to problems having objects scheduled in itineraries, the method comprising the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying objects to be rerouted;

grouping the objects to be rescheduled into subproblems, wherein each subproblem is defined by each object therein having the same original origin and destination; and

applying an algorithm for generating solutions to each subproblem.

15. A method as recited in Claim 14, wherein the algorithm is a transportation algorithm.

16. A method as recited in Claim 14, further comprising the steps of:

identifying a subclass of objects that are unsuitably rescheduled in the initial solutions;

applying a shortest path algorithm for rescheduling the subclass to generate additional possible rescheduling solutions for the each object in the subclass.

17. A method as recited in Claim 16, further comprising the steps of:

applying an IP algorithm based upon the additional possible rescheduling solutions to generate a practical solution for rerouting the objects.

18. A method as recited in Claim 17, further comprising the steps of:

excluding the identified subclass to reduce the disruption specification; and

solving the reduced specification by applying a transportation algorithm.

19. A method as recited in Claim 18, further comprising the step of varying the origin and destination of the objects only at the step of solving the reduced specification.

20. A method as recited in Claim 18, further comprising the step of grouping the objects by segment prior to solving the reduced disruption specification

21. A method for generating solutions to problems having objects scheduled in itineraries, the method comprising the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying objects to be rerouted;

grouping the objects to be rescheduled into subproblems, wherein each subproblem is defined by each object therein having the same original origin and destination;

applying a transportation algorithm for generating solutions to each subproblem;

identifying a subclass of objects that are unsuitably rescheduled in the initial solutions; and

applying a shortest path algorithm for rescheduling the subclass to generate multiple possible rescheduling solutions for the each object in the subclass; and

applying an IP algorithm based upon the transportation algorithm and shortest path algorithm solutions to generate a practical solution for rerouting the objects.

excluding the subclass of objects from the objects that need to be rescheduled in the disruption specification; and

applying a fourth algorithm to the remaining objects in the reduced disruption specification to determine rescheduling solutions for the remaining objects.

22. A method according to Claim 21, wherein during applying the shortest path algorithm, a temporal limitation of arrival time is included in the disruption specification.

23. A method according to Claim 21, wherein the forth algorithm is the same as the transportation algorithm.

24. A method as recited in Claim 21, wherein the objects are passengers traveling on one of a group consisting of an airplane, a train and a bus.

25. A method as recited in Claim 21, wherein the IP algorithm uses a branch and bound technique with a cost function.

26. A method as recited in Claim 21, wherein the cost function is

$$\min \sum_{ij} (c_{ij} x_{ij}) + \sum_{i} u_i (N_i - \sum_{j} x_{ij})$$

wherein: an itinerary class (hereinafter "IC") is an itinerary consisting of a sequence of cabin classes on specific flights; a PaxGroup (hereinafter "PG") is a group of passengers that have booked the same itinerary and are booked in the same cabin class on each of the flights in the itinerary; x_{ij} is the number of passengers from PG i, who are assigned to IC j; c_{ij} is the cost of assigning one passenger from PG_i to IC_j; u_i is the cost of leaving one passenger from PG_i unhandled; and N_i is the number of passengers in PG_i.

27. An engine for generating solutions to a rescheduling disruption of objects comprising:

applying a first process for large problems; and

applying a second process for small problems, wherein the small and large problems are defined by a user.

28. A method according to Claim 27, wherein the first process includes the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying objects to be rerouted;

grouping the objects to be rescheduled into subproblems, wherein each subproblem is defined by each object therein having the same original origin and destination;

applying a transportation algorithm for generating solutions to each subproblem;

identifying a subclass of objects that are unsuitably rescheduled in the initial solutions; and

applying a shortest path algorithm for rescheduling the subclass to generate additional possible rescheduling solutions for the each object in the subclass.

29. A method according to Claim 27, wherein the first process further includes the step of solving an IP problem for all passengers.

30. A method according to Claim 27, wherein the second process includes the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying at least one object to be rerouted;

applying a shortest path algorithm to generate a plurality of LP solutions for rerouting the at least one object; and

applying an IP algorithm based upon the plurality of LP solutions to generate a practical solution for rerouting the at least one object.

31. A method according to Claim 27, wherein the second process includes the steps of:

receiving a disruption specification based upon an event, the disruption specification including data identifying objects to be rerouted;

grouping the objects to be rescheduled into subproblems, wherein each subproblem is defined by each object therein having the same original origin and destination; and

applying a transportation algorithm for generating solutions to each subproblem.